

REMARKS

Claims 1-4, 6-10, 13, 16 and 17 stand rejected under 35 U.S.C. §103 as being unpatentable over United States Patent Application Publication No. 2002/0075429 to Fujioka et al. in view of United States Patent No. 6,181,397 to Ichimura et al. and United States Patent No. 4,846,560 to Tsuboyama et al. Applicants respectfully traverse this rejection.

Applicants respectfully submit that one of ordinary skill in the art would not have been motivated to make a substrate for a liquid crystal display including a “cell gap control layer [that] reduces the cell gap in the display area to be greater than 1 μm and less than 2 μm ” in combination with a sealing material that “has a thickness, measured perpendicular to the base substrate, that is greater than approximately 3.5 μm and less than 5 μm ,” as defined in amended independent Claims 1 and 3.

Applicants disagree with the Examiner’s assertion on page 10 of the August 23, 2006 Final Office Action that “the cell gap [of Figure 13 of Fujioka et al.] is 3 microns thinner than the thickness of the sealing material due to the presence of layer 104” because the Examiner has neglected to consider the thicknesses of color layer 106, both orientation films 112, pixel electrodes 202 and counter electrode 209. More specifically, the color layer 106 is 1.5 μm thick (paragraphs 0097 and 0105) and the combination of both orientation films 112, pixel electrodes 202 and counter electrode 209 is approximately 0.5 μm (*see* Figure 9 and paragraphs 0099 and 0097 that describe d_{sel} as 5 μm and the diameter of spacer 116 as 4.5 μm , whereby the total thickness of 5 μm of both orientation films 112, pixel electrodes 202 and counter electrode 209 results from subtracting the diameter of spacer 116

(4.5 μm) from the 5 μm thickness d_{se1}). Accordingly, the cell gap is actually 5 μm thinner (3 μm plus 1.5 μm plus 0.5 μm) than the thickness of the sealing material. Thus, it follows that (where there is no overlap between the sealing material 103 and the insulation film 104), the sealing material 103 must be of a thickness appreciably greater than 5 μm , otherwise the cell gap would be zero or less.

In contrast, in the invention of Applicants' amended independent Claims 1 and 3, the thickness of the sealing material is less than 5 μm , and the resulting cell gap in the display area is greater than 1 μm and less than 2 μm . If a sealing material of a thickness less than 5 μm were used in the Figure 13 embodiment of the Fujioka et al. reference (with no overlap between layers 103 and 104), the cell gap would be zero or less (because layers 104, 112, 202, 209 and 106 have a combined thickness of 5 μm). Further, paragraph 0106 of Fujioka et al. teaches away from using a sealing material with a thickness of less than 5 μm ("it is preferable to employ a structure as shown in FIG. 13 in which the thickness D1 of the sealing material 103 is at least 5 μm or greater"). Accordingly, Applicants respectfully submit that one of ordinary skill in the art would not have been motivated to make the device of Fujioka et al. with non-overlapping sealing material of a thickness of less than 5 μm , as defined in Claims 1 and 3, because such a device would not operate because the cell gap would be zero or less. Such a device would also lack a cell gap of greater than 1 μm and less than 2 μm , as also defined in independent Claims 1 and 3.

Further, Applicants respectfully submit that even the inclusion of the Ichimura and Tsuboyama et al. references does not remedy the deficiencies noted above because, due

to the presence of layers 104, 112, 202, 209 and 106 in Fujioka et al., the thickness of the sealing material, when it does not overlap layer 104, cannot be less than 5 μ m because otherwise the cell gap would be zero, instead of the claimed thickness of greater than 1 μ m and less than 2 μ m. Accordingly, as all of the features of independent Claims 1 and 3 are not disclosed or suggested in the cited references, Applicants respectfully request the withdrawal of this §103 rejection of independent Claims 1 and 3 and associated dependent Claims 2, 4, 6-10, 13 16 and 17.

Claim 5 stands rejected under 35 U.S.C. §103 as being unpatentable over Fujioka et al. in view of Ichimura et al. and Tsuboyama et al. and further in view of United States Patent No. 5,748,266 to Kodate. Claims 11, 12, 14 and 15 stand rejected under 35 U.S.C. §103 as being unpatentable over Fujioka et al. in view of Ichimura et al. and Tsuboyama et al. and further in view of United States Patent No. 6,100,954 to Kim et al. Applicants respectfully traverse these rejections.

Claims 5, 11, 12, 14 and 15 all depend, directly or indirectly, from either independent Claim 1 or independent Claim 3, and therefore include all of the features of either Claim 1 or Claim 3, plus additional features. Accordingly, Applicants respectfully request that these §103 rejections of dependent Claims 5, 11, 12, 14 and 15 be withdrawn considering the above remarks directed to independent Claims 1 and 3, and also because the additional cited references do not remedy the deficiencies discussed above.

Claims 18-24 and 26-32 stand rejected under 35 U.S.C. §103 as being unpatentable over Fujioka et al. in view of Kim et al. and further in view of United States Patent No. 5,381,255 to Ohnuma et al. Applicants respectfully traverse this rejection.

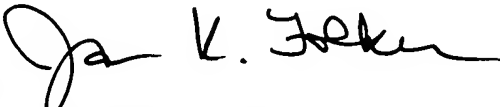
Amended independent Claims 18 and 23 both include a “cell gap control layer [that] reduces the cell gap in the display area to be greater than 1 μm and less than 2 μm ” in combination with a sealing material that “has a thickness, measured perpendicular to the base substrate, that is greater than approximately 3.5 μm and less than 5 μm .” These features are also recited in independent Claims 1 and 3. Accordingly, for the same reasons discussed above with regard to the rejection of Claims 1 and 3, and also because the Ohnuma et al. reference does not remedy the deficiencies discussed above, Applicants respectfully request the withdrawal of this §103 rejection of independent Claims 18 and 23 and associated dependent Claims 19-22, 24 and 26-32.

For all of the above reasons, Applicants request reconsideration and allowance of the claimed invention. Should the Examiner be of the opinion that a telephone conference

would aid in the prosecution of the application, or that outstanding issues exist, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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